



Beyond conferences and journal publications: Publishing and presenting research online through a Virtual Poster Session

Angelika Renner^{1,2}, Jenny Baeseman¹, the APECS VPS Working Group

¹Association of Polar Early Career Scientists (APECS)

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The 6th Munin Conference - Enhancing publications, Tromsø, 22-23 Nov 2011

Some background first:

❄️ who and what is APECS?

international and interdisciplinary organisation for people with interest in polar regions and the wider cryosphere

❄️ what are the aims of APECS?

stimulate collaborations and develop future leaders in polar research, education and outreach

❄️ how?

- facilitate networking
- provide opportunities for career development
- promote education and outreach

<http://www.apecs.is>



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November 2011 Newsletter Available



October was another very productive month for APECS and our partners. We invite you to read more about our activities in the latest newsletter: Some highlights:- Time to check out the 'small stuff' as November is Microbial Ecology Month and APECS researchers are sharing their new discoveries and learning from leading experts in t...

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ABOUT APECS

APECS is an international and interdisciplinary organization for undergraduate and graduate students, postdoctoral researchers, early faculty members, educators and others with interests in Polar Regions and the wider cryosphere. Our aims are to stimulate interdisciplinary and international research collaborations, and develop effective future leaders in polar research, education and outreach.



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International Arctic Science Committee (IASC)



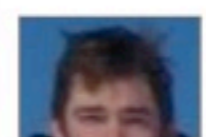
The International Arctic Science Committee (IASC) encourages, facilitates and

APECS EVENTS

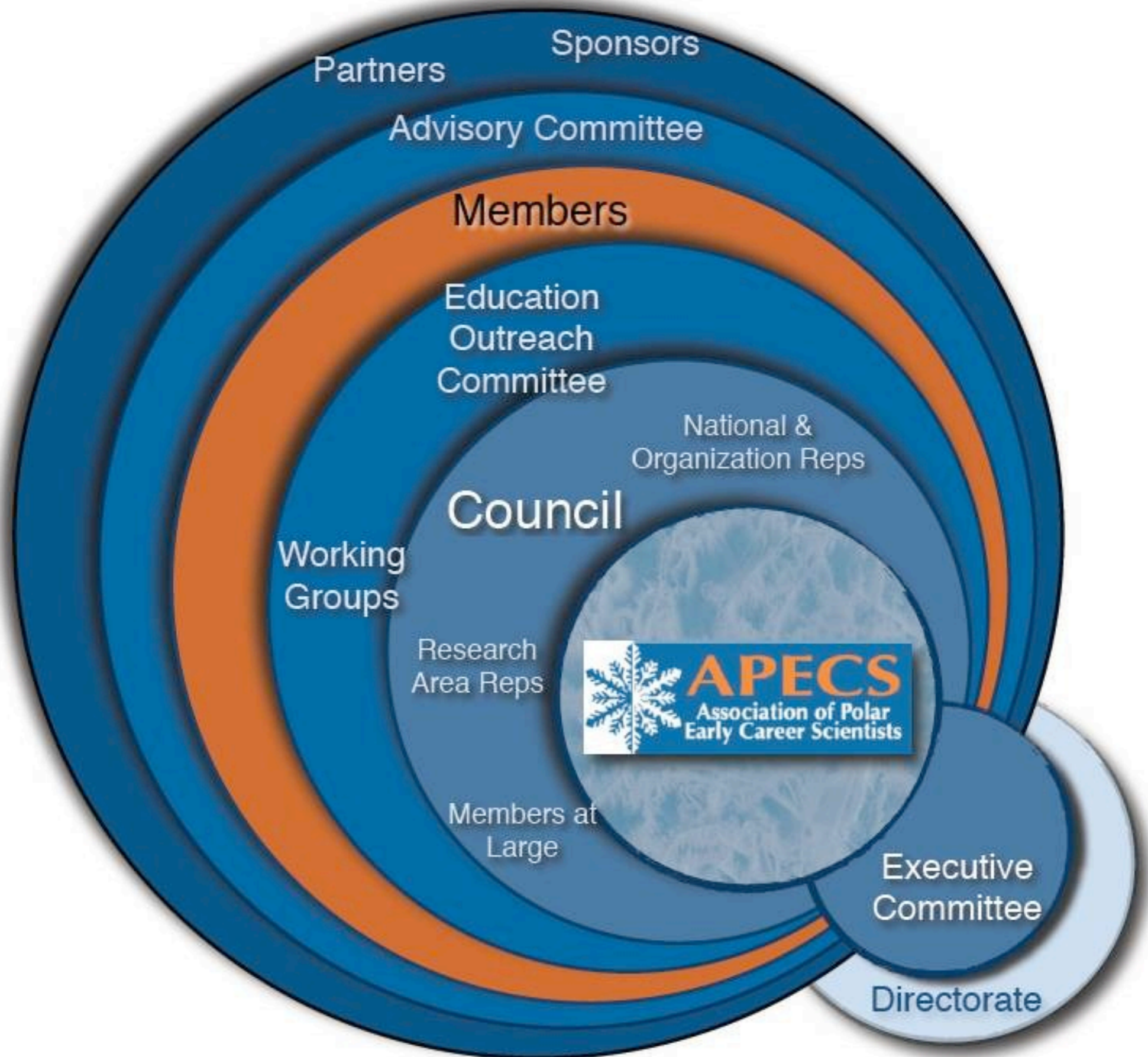
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FEATURED MEMBER

Oliver Marsh



Gateway Antarctica, University of Canterbury, Christchurch, New Zealand



Some more facts about APECS:

- directorate based at UiT
- over 3000 members in over 75 countries and growing
- just in the 2010/2011 term: 30 mentor panels and workshops in 15 countries
- national committees/groups in 9 countries, 1 starting soon, 10 more in progress
- partnerships with various scientific organisations
- ONE paid member of staff!

The Virtual Poster Session (VPS) - taking posters beyond the traditional conference setting

=> web-based tool

=> easy, open access

=> free platform to share results, exchange ideas, get feedback

=> develop better communication skills

Part I: Online poster database



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Investigation of regional sea ice budgets in the Arctic using the sea ice/ocean model NAOSIM

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Authors:

S. Kohnemann *, G. Heinemann *, D. Schröder **, S. Willmes * and C. Koeberle ***

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** Centre for Polar Observation & Modelling, London, UK ,

*** Alfred Wegener Institut, Bremerhaven, Germany

Originally presented at:

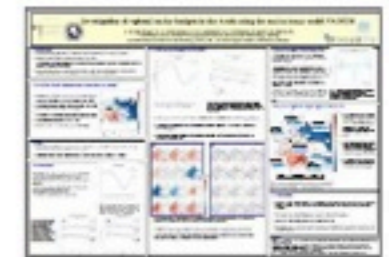
EGU General Assembly 2011

Abstract/Summary:

Remote sensing data show a continuous decrease of sea ice in the past 30 years. Climate models predict a further decreasing for the future. Therefore, a closer analysis of the production processes, the trend development and the regional variability is necessary. The Laptev Sea plays an important role for the Arctic sea ice budget due to a high polynya activity at the Siberian coast. The coupled ocean-sea ice model NAOSIM (North Atlantic/Arctic Ocean- Sea Ice Model) is used for the study of thermodynamic and dynamic ice production processes for the whole Arctic for the period 1990-2008. The simulation is driven by daily NCEP/NCAR data, and the horizontal resolution of the model is about 9km. Sea ice concentration from satellite data is used for the verification of model results. The model is able to reproduce the mean annual cycle and the negative trend realistically. A detailed analysis of the thermodynamic sea ice production/melt and the dynamic redistribution for different regions of the Arctic shows that the mean sea ice production of the Laptev Sea area exceeds the sea ice melt rate by 740 km³/a. That sea ice volume is transported into the central Arctic. The net ice production in the Laptev Sea is as large as the net ice production in the central Arctic north of 80° N. The Laptev Sea is found to be the largest ice producer compared to other Arctic shelf areas. In addition, the interannual variability of sea ice production in the Laptev Sea is small compared to other regions. A negative trend of sea ice in the Laptev-Sea is not found. For the entire Arctic sea ice volume decrease amounts to the average of -450 km³/a from 1990 to 2008. Studies for years with extreme sea ice anomalies show no direct connections between the sea ice production of the Laptev Sea and the sea ice volume of the entire Arctic.

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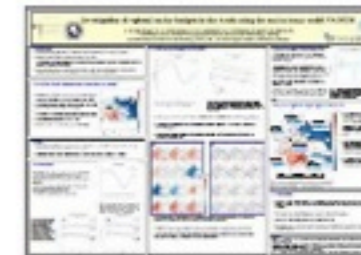
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Investigation of regional sea ice budgets in the Arctic using the sea ice/ocean model NAOSIM

S. Kohnemann (1), G. Heinemann (1), D. Schröder (2), S. Willmes (1) and C. Koeberle (3)
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 (2) Centre for Polar Observation & Modelling, London, UK, (3) Alfred Wegener Institut, Bremerhaven, Germany

1 Motivation

- Remote sensing data show a continuous decrease of sea ice in the past 30 years.
- Climate models predict a further decreasing in the future. Therefore, a closer analysis of the production processes, the trend development and the regional variability is necessary.
- The Laptev-Sea plays an important role for the Arctic sea ice budget due to its high polynya activity at the Siberian coast resulting in an increasing sea ice production.

2 NAOSIM (North Atlantic/Arctic Ocean Sea Ice Model)

- NAOSIM is a coupled ocean-sea ice model developed at the AWI (Janzes et al., 2002; Hasler et al., 2002).
- The model domain covers the North Atlantic, the Nordic Seas and the whole Arctic Ocean (Fig. 1).
- It is based on a thermodynamic dynamic sea ice model.
- The resolution amounts to 0.05° × 0.05°.
- Simulated data cover the time period 1990-2008.

3 Arctic sea ice budget by NAOSIM

Fig. 3: The seasonal cycle of sea ice volume of the Arctic for 1990-2008.

Fig. 4: The ice volume time series of the Arctic for spring (2000), summer (2001), autumn (2002) and winter (2003) for the years 1990-2008. The straight line presents the linear trend.

Fig. 5: The ice volume time series of the Laptev Sea for spring (2000), summer (2001), autumn (2002) and winter (2003) for the years 1990-2008. The straight line presents the linear trend.

Fig. 6: The ice volume time series of the Laptev Sea for spring (2000), summer (2001), autumn (2002) and winter (2003) for the years 1990-2008. The straight line presents the linear trend.

Fig. 7: Mean sea ice volume changes due to thermodynamic and dynamic processes (1990-2008). Detailed description see poster as mouse-over.

4 Sea ice budget of the Laptev-Sea

- The mean sea ice volume of the Laptev-Sea varies between 1100 km³ in April and 110 km³ in September (Fig. 3).
- Strong sea ice export up to 400 km³ of the Laptev-Sea occurs from September to May (Fig. 2).
- The mean net sea ice production amounts to 740 km³ annually. This corresponds to 25% of the sea ice export of the Arctic through the Fram Strait (e.g. Voge et al., 1995).
- There is no correlation between the variability of the Arctic and the variability of the Laptev-Sea due to the constant sea ice production of the Laptev-Sea.

5 Sea ice budget for single regions of the Arctic

Fig. 8: The regional sea ice budgets reflect the overall decreasing trend of the Arctic sea ice volume (1990-2008) (Fig. 3), especially in Canada the differences are enhanced by problems of the model borders.

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Investigation of regional sea ice budgets in the Arctic using the sea ice/ocean model NAOSIM
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 (2) Centre for Polar Observation & Modelling, London, UK, (3) Alfred Wegener Institut, Bremerhaven, Germany
Universität Trier

1 Motivation

- Remote sensing data show a continuous decrease of sea ice in the past 30 years.
- Climate models predict a further decreasing in the future.
→ Therefore, a closer analysis of the production processes, the trend development and the regional variability is necessary.
- The Laptev-Sea plays an important role for the Arctic sea ice budget due to a high polynya activity at the Siberian coast resulting in an increasing sea ice production.

2 NAOSIM (North Atlantic/Arctic Ocean Sea Ice Model)

- NAOSIM is a coupled ocean-sea ice model developed at the AWI [Gerdes et al., 2003; Karoher et al., 2003].
- The model domain covers the North Atlantic, the Nordic Seas and the whole Arctic Ocean (Fig.1).
- It is based on a thermodynamic-dynamic sea ice model.
- The resolution amounts to $0.06^\circ \times 0.06^\circ$.
- Simulated data cover the time period 1990-2008.

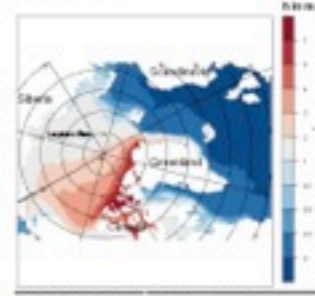


Fig.1: NAOSIM model domain showing the sea ice thickness mean (in m) 1990-2008.

3 Data

- Model data: monthly means of sea ice concentration, sea ice thickness and sea ice changes due to thermodynamic and dynamic processes.
- Verification data: SSM/I monthly means of the sea ice cover [Fetterer et al. 2009].

4 Verification

- NAOSIM data show good agreements with SSM/I data: good reproduction of the mean annual cycle, the time series of the seasons and the trends (Fig.2,3).
- There is a model underestimation of the sea ice area at the beginning of the year.
- NAOSIM is applicable for further work.

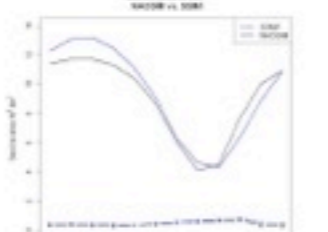
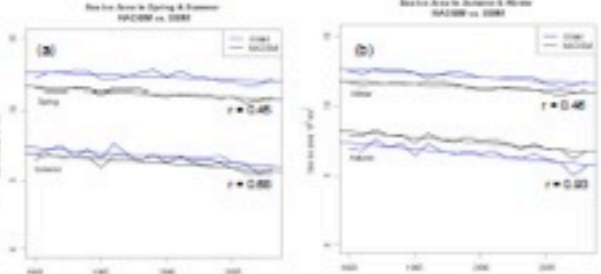
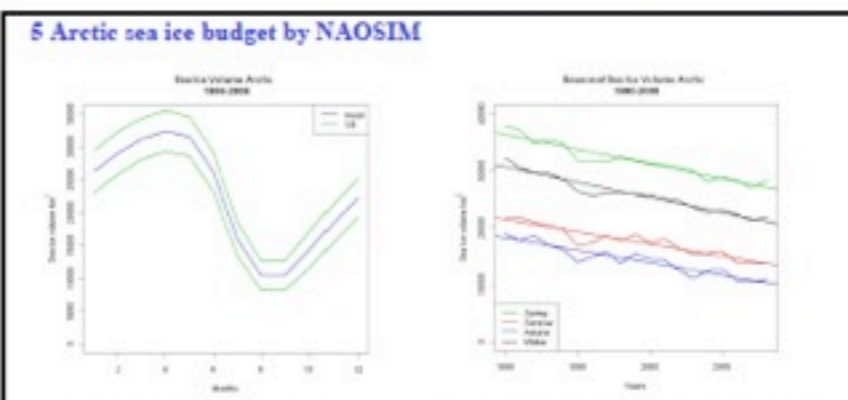
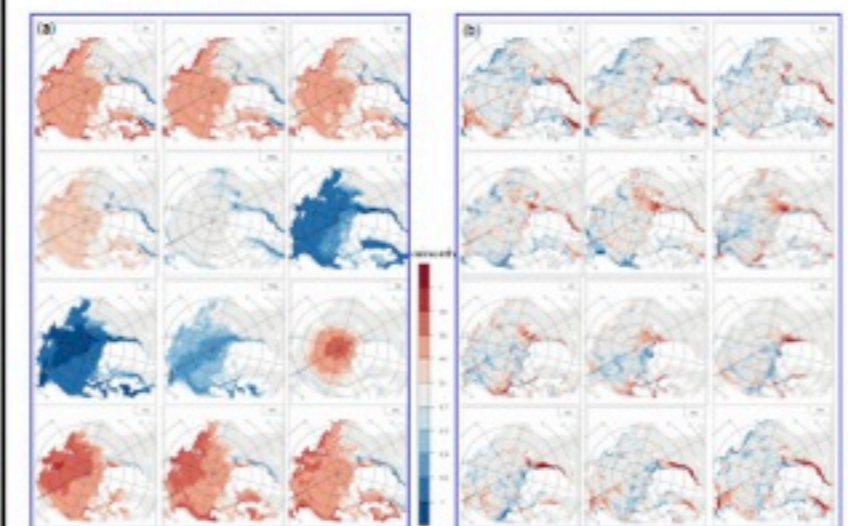


Fig.2: Mean annual cycle of Arctic sea ice area (1990-2008) for NAOSIM (black) and SSM/I data (blue). Standard deviations are plotted as dashed lines in the bottom.

Fig.3: Time series for the sea ice area from 1990-2008, individually for spring and summer (a), winter and autumn (b). Blue lines are SSM/I data, black lines represent NAOSIM data. Straight lines indicate the trend.

- Arctic sea ice volume varies between 33000 km³ and 10000km³ from April to August (Fig.4)
- A markable decreasing trend in all seasons is striking: autumn $\sim -436 \text{ km}^3/\text{a} \pm 9000 \text{ km}^3$ in 1990-2008 (Fig.5).
- If the autumn trend continue in the following decades, the Arctic would be ice free for the first time in autumn 2032.



- 23000 km³ sea ice grow within 8 months and melt within 4 months in the Arctic (Fig.6).
- The Laptev-Sea is a region with dominant mean sea ice production, the Fram-Strait with strong sea ice melting. → Result is a sea ice redistribution.

6 Sea ice budget of the Laptev-Sea

- The mean sea ice volume of the Laptev-sea varies between 1700 km³ in April and 110 km³ in September (Fig.6).
- Strong sea ice export up to 400 km³/a of the Laptev-Sea occurs from September to May (Fig.7).
- The mean net sea ice production amounts to 740 km³/a. This corresponds to 25% of the sea ice export of the Arctic through the Fram-Strait [e.g. Vinje et al., 1998].
- There is no correlation between the variability of the Arctic and the variability of the Laptev-Sea due to the constant sea ice production of the Laptev-Sea.

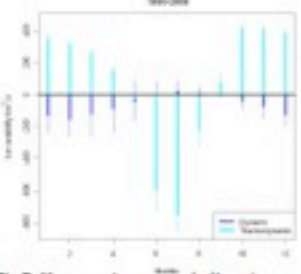
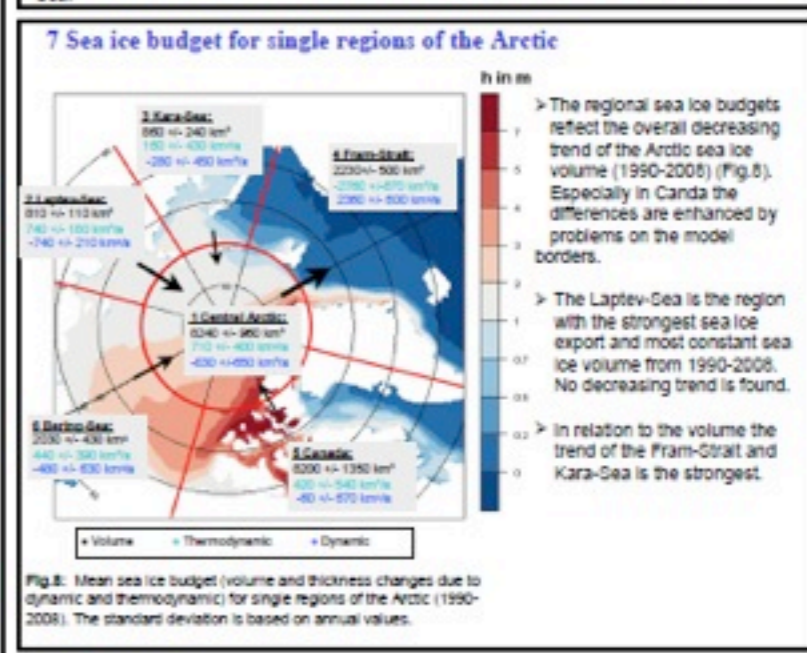


Fig.7: Mean sea ice volume changes of the Laptev-Sea due to thermodynamic and dynamic processes (1990-2008). Standard deviations are plotted as thinner lines.



8 Conclusion

- NAOSIM shows good results in the verification with SSM/I data and thus it can be used for further analysis of sea ice volume and thermodynamic and dynamic sea ice thickness changes.
- The Laptev-Sea shows high sea ice export in other Arctic regions.
- There is no decreasing trend in the Laptev-Sea so far.
- The Laptev-Sea polynyas cannot be reproduced realistically because the model does not simulate fast-ice.

References

Fetterer, F., K. Knowles, W. Meier, and M. Savoie (2002, updated 2009): Sea Ice Index. Boulder, Colorado USA: National Snow and Ice Data Center. Digital media.

R. Gerdes, M. J. Karoher, F. Kauker, and U. Schauer (2003): Causes and development of repeated Arctic Ocean warming events. Geophysical Research Letters, 30(19) 1960.

M. J. Karoher, R. Gerdes, F. Kauker, and C. Koeberle (2002): Arctic warming: Evolution and spreading of the 1980s warm event in the Nordic seas and the Arctic Ocean. J. Geophys. Res., 107(C2) 3024.

Vinje, T., N. Rudstam, and A. Krastev (1998): Monitoring ice thickness in Fram Strait. J. Geophys. Res., 103 10437-10449.

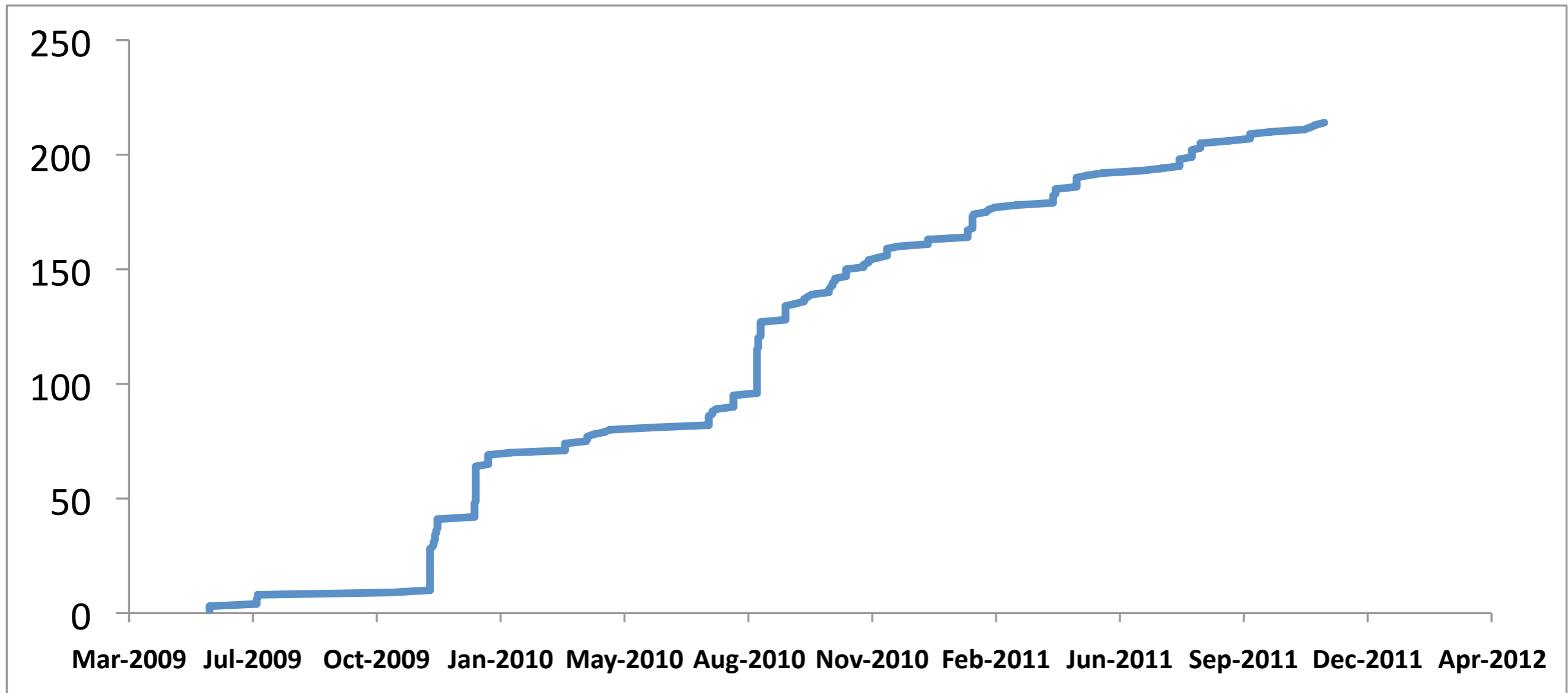
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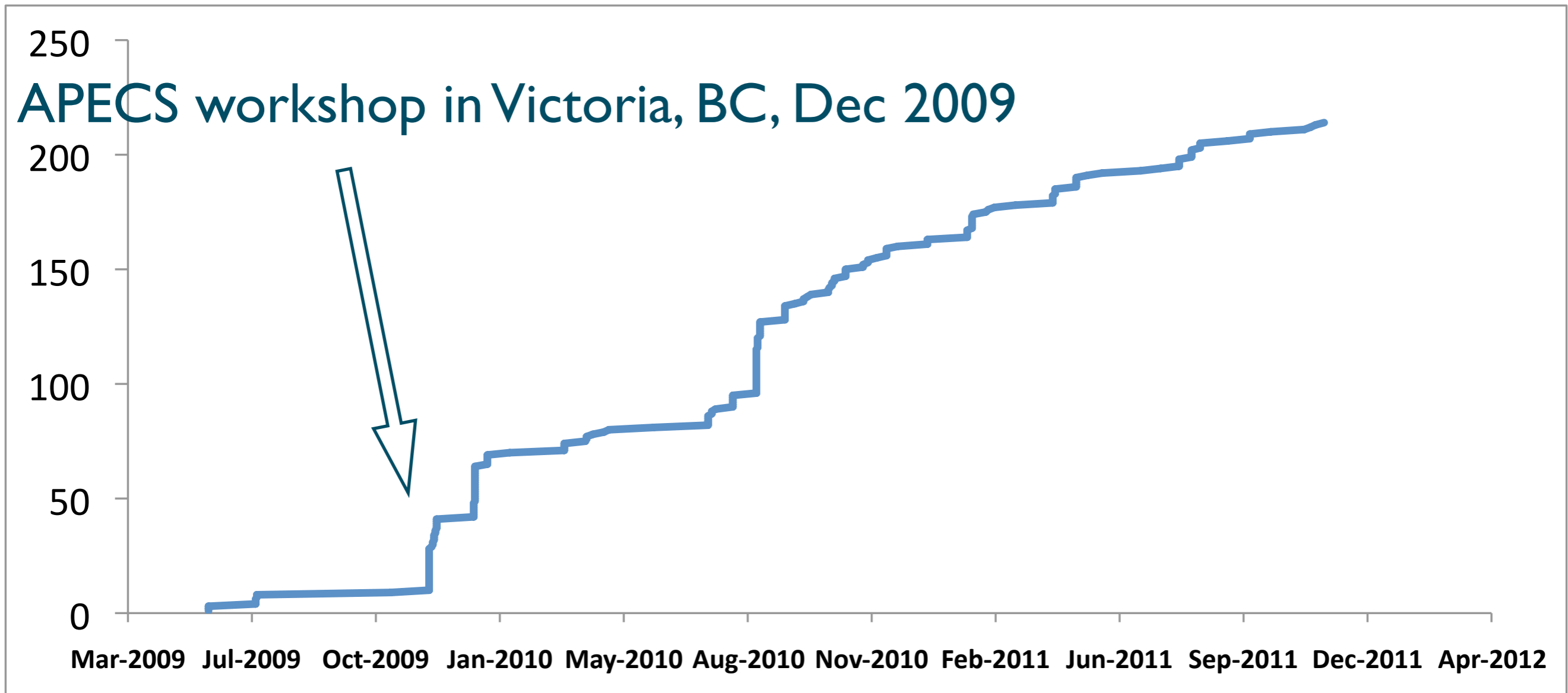
Some numbers:

- start in June 2009
- no. of poster as of 20/11/2011: 214
- no. of countries of origin, 1st authors: 31
- no. of countries of origin, all authors: 34

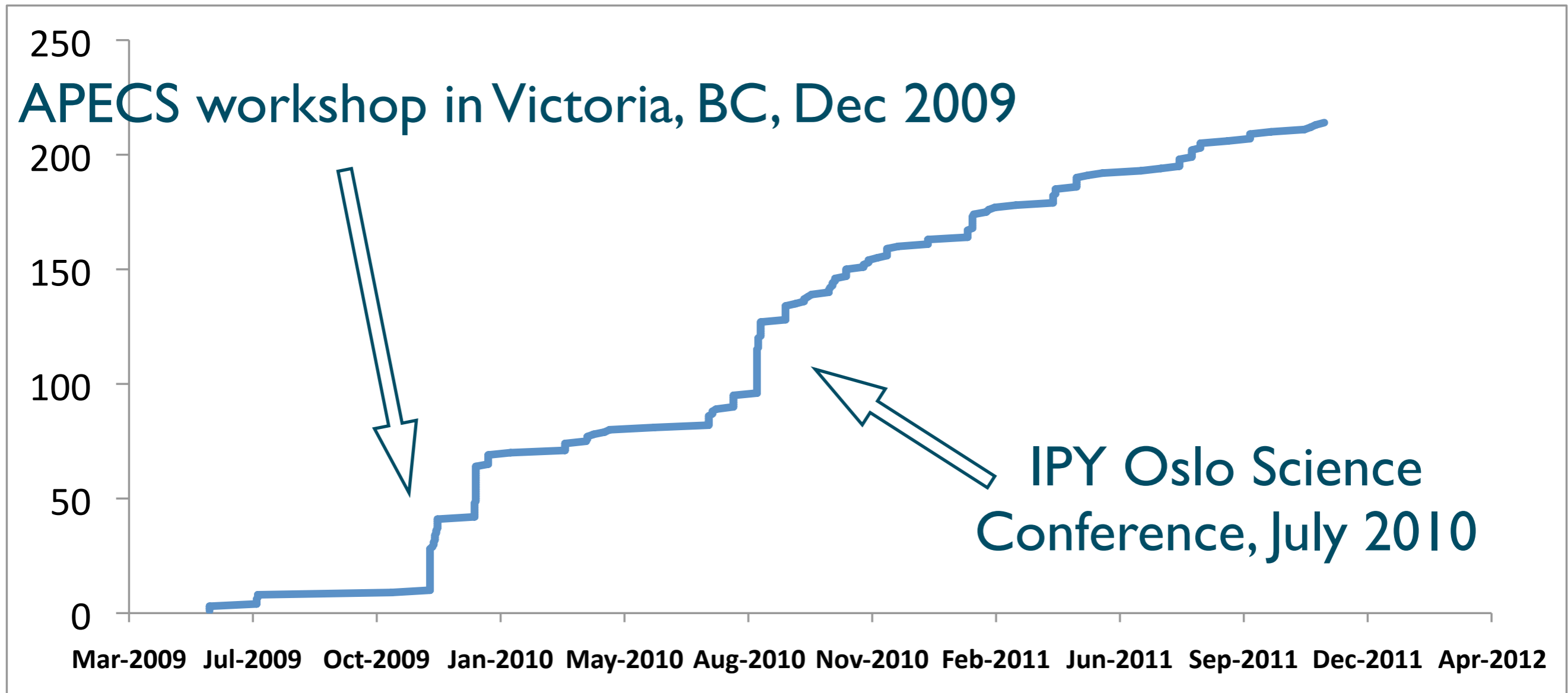
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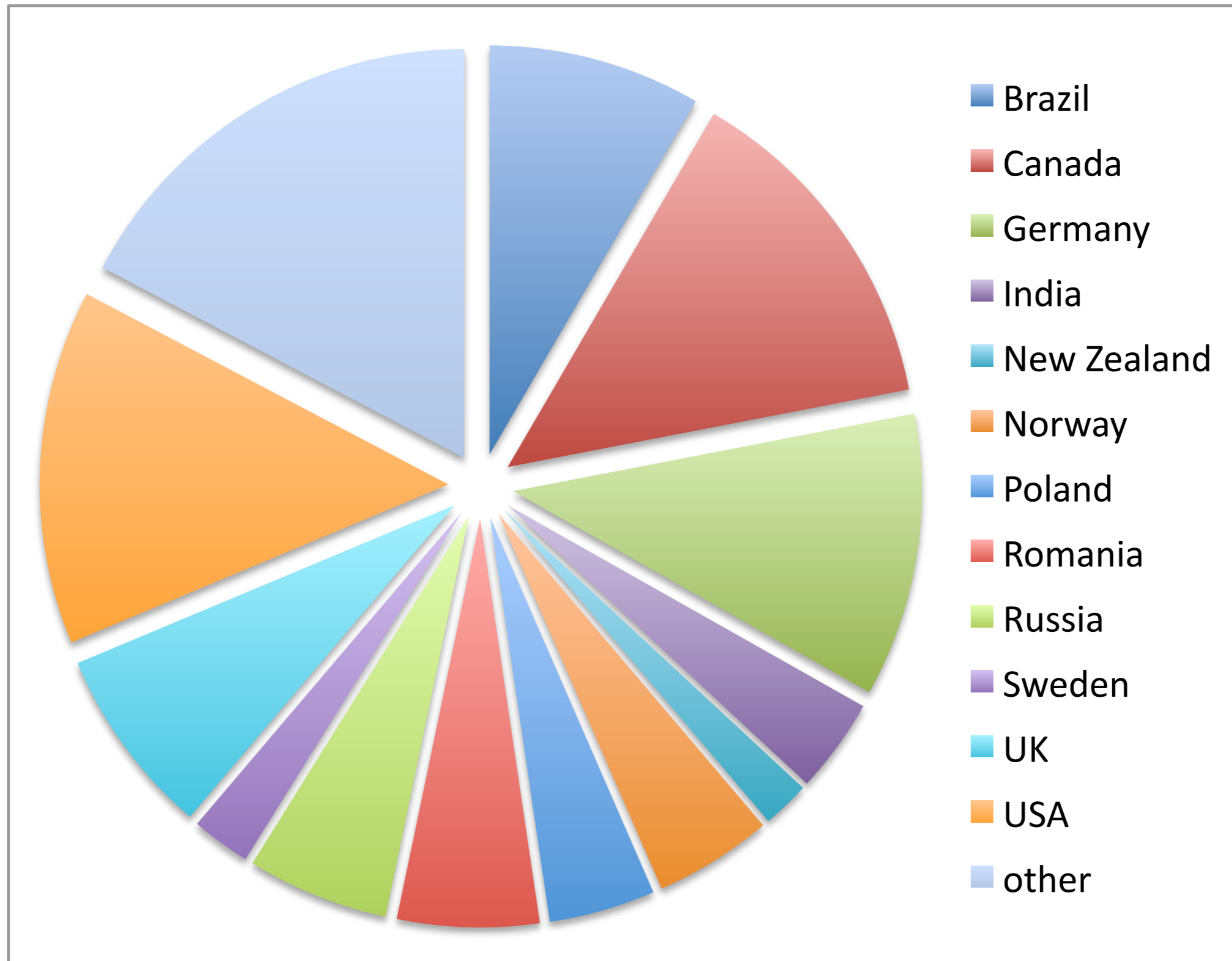
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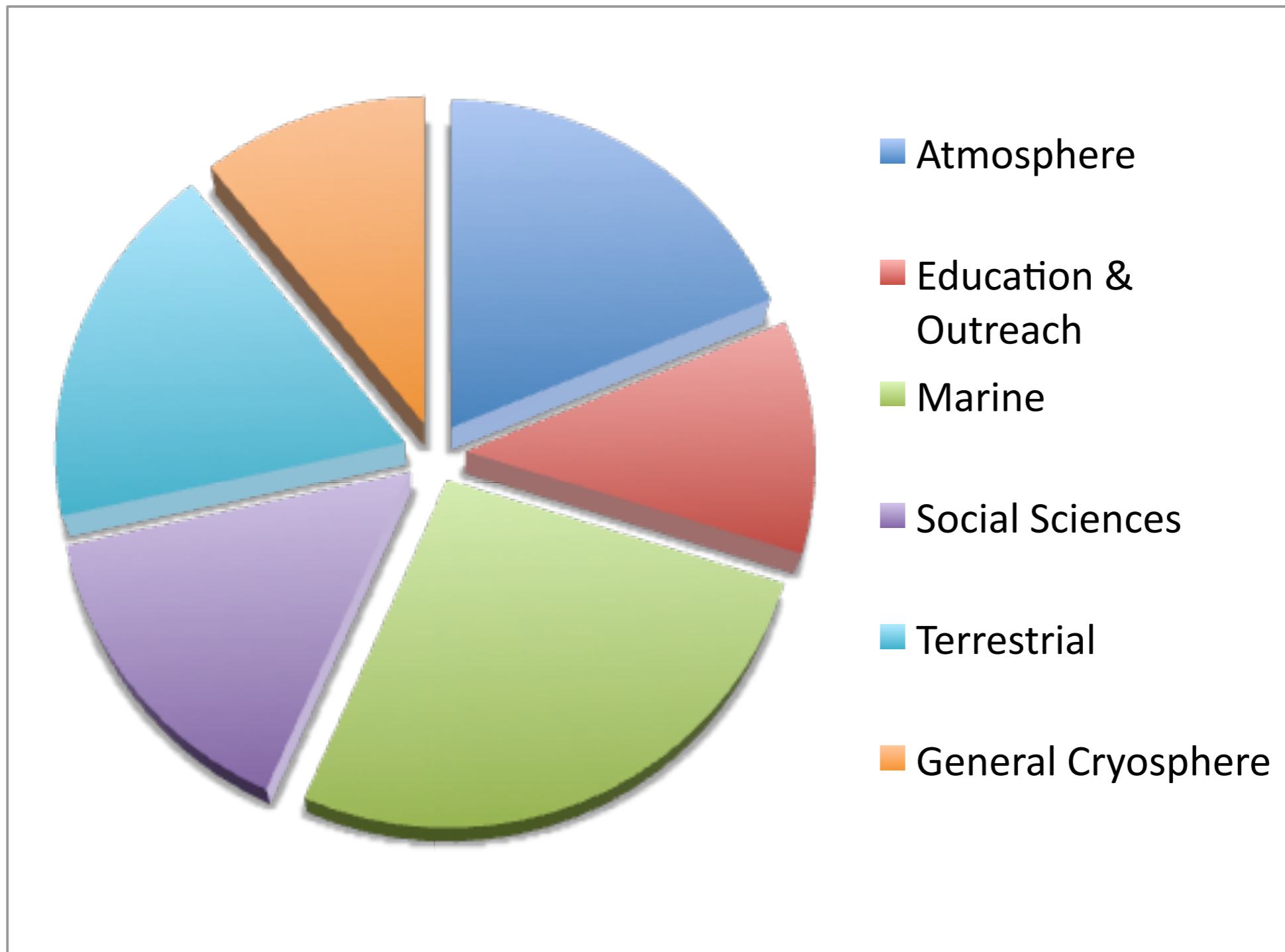
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Contributions by country



Posters by discipline



Part II: Online poster sessions

Part II: Online poster sessions

Part II: Online poster sessions

- Live sessions using an online conferencing system, recording available afterwards
- usually 3-4 presenters
- topic by discipline, country, research region, ...
- all that's needed to participate: computer with internet connection!
- so far: 16 calls with >250 participants

Attendee List (20)

- angelika renner
- APECS ExCom
- APECS ExCom 2
- Joel
- Rolf Gradinger
- Steve Ackley, UTSA
- Steven
- Allen Pope
- Andrea Gierisch
- Burcu Ozsoy-Cicek, ITU
- Conthia Naudin

Chat

if the algal composition in the early algal bloom is the same as the algal composition later on in the summer season

Tosca Ballerini: OK, thanks!

Allen Pope: Yes

APECS ExCom: yep

APECS ExCom: cant hear you

Tosca Ballerini: we cannot hear you

APECS ExCom: your good


Allen Pope: We're good now

APECS ExCom: its very small

Stefan Kern, CliSAP/KlimaCampus: it becomes even smaller

Stefan Kern, CliSAP/KlimaCampus: ahhhh

Note



Sea Ice Detection with the Advanced Scatterometer

Steven Reeves and David G. Long

Abstract

Sea ice extent can be estimated from a variety of active and microwave instruments. Scatterometers are active microwave instruments that have proven useful at estimating the ice extent from measured radar backscatter (σ^0). This poster presents a method to detect sea ice using enhanced resolution images from the Advanced Scatterometer (ASCAT).

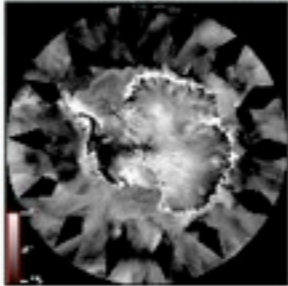
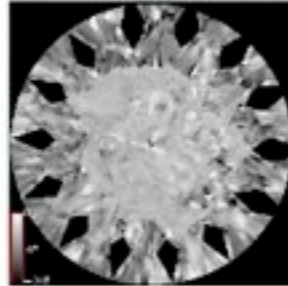
ASCAT

The (ASCAT) instrument is a fan beam scatterometer launched on the MetOP-A satellite in October 2006 by ESA/EUMETSAT [1]. Some of the characteristics are:

- 6 fan beam antennas at 5.255 GHz (C-band)
- vertical polarization
- 550 km swath on both sides
- 29 day exact repeat orbit, 5 day near repeat orbit

SIR

The Scatterometer Image Reconstruction (SIR) algorithm is used to enhance the resolution of scatterometer images [2]. The algorithm uses multiple passes of the scatterometer over an area to generate an image at higher resolution than the native resolution of the instrument. The SIR algorithm assumes a linear relationship between the incidence angle and σ^0 : $\sigma^0(\theta_i) = A + B(\theta_i - \theta_{ref})$, where θ_i is the incidence angle, $\sigma^0(\theta_i)$ is the measured backscatter at a given incidence angle, A represents the average backscatter normalized to a reference angle, B represents the incidence angle dependence of the backscatter, and θ_{ref} is a reference angle usually 40° . Examples of A and B SIR images over Antarctica on March 21, 2009 for ASCAT are shown in Figure 1. The variance of the reconstruction error for each pixel is used to produce "V" images. These images represent changes in the observed σ^0 due to variations in time, azimuth angle, and incidence angle.

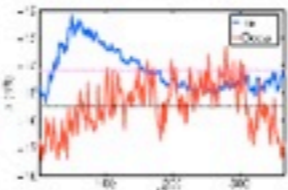
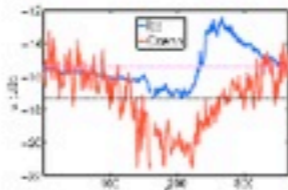



(a) ASCAT A image (b) ASCAT B image

Figure 1: ASCAT SIR images from March 21, 2009 over Antarctica.

Sea Ice Statistics for Scatterometer Data

The sea ice and ocean statistics for 2009 for the ASCAT A images are shown in Figure 2. The QuikSCAT ice maps [3] from 2009 were used to separate the ice from the ocean.

(a) Antarctica (b) Arctic

Figure 2: Mean value of the A images for each day in 2009 for ice and ocean. Note the seasonal dependence of the mean values. In Antarctica, the A mean values are typically higher in the Austral summer than in the winter, and the Northern hemisphere shows a similar seasonal dependence.

Bayesian Algorithm for ASCAT

The algorithm relies on a prior generated from the previous day's ice map and on a pixel based decision rule:

$$\hat{c}(x) = \begin{cases} \text{sea ice,} & \text{if } p(x|\omega_1)P(\omega_1) > p(x|\omega_0)P(\omega_0), \\ \text{ocean,} & \text{otherwise.} \end{cases} \quad (1)$$

where $x = [A, B, V]$ is the feature vector, ω_0 is the ocean class, ω_1 is the ice class, $p(x|\omega_i)$ is conditional pdf of the feature vector given the respective class, and $P(\omega_i)$ is the prior probability for either sea ice or ocean. The algorithm consists of a series of steps:

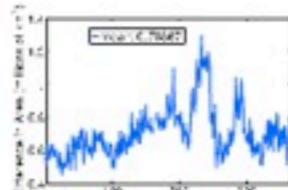
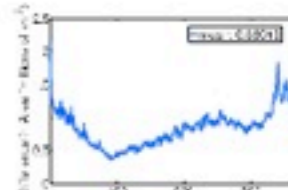
1. Gather all relevant data (images, previous day's ice map).
2. Generate priors from previous day's ice map.
3. Generate initial estimate of conditional pdf.
4. Classify each valid pixel using decision rule given by (1).
5. Update prior maps.
6. Update conditional pdf with current ice map.
7. Repeat steps 4-6 (this is done 3 times).
8. Constrain ice mask to maximum limit.
9. Classify areas of no data using previous day's ice map.
10. Median filter the "on maps".

SCP

For more information, visit the Scatterometer Climate Prediction (SCP) site <http://scp.byu.edu>

Comparison of Ice Extent Algorithms

Ice maps were produced using the new algorithm for each day of 2009. The NASA Team (NT) ice concentration maps from AMSR-E data were used to compare to the new algorithm [4]. These maps give the ice concentration for a given pixel. The NT ice maps are interpolated to be on the same grid as the ASCAT ice maps. Figure 3 shows the difference in area between the ASCAT ice maps and the NT 15% concentration. Overall, the new ice maps agree well with the NT maps.

(a) Arctic (b) Antarctic

Figure 3: Difference in area between the Bayes ice maps and the NT 15% ice concentration maps for 2009. The ASCAT ice maps were also compared to the QuikSCAT ice maps [3] with similar results.

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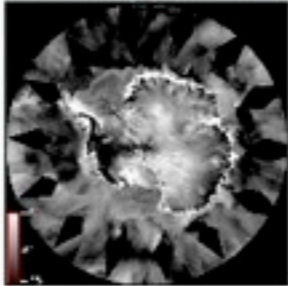
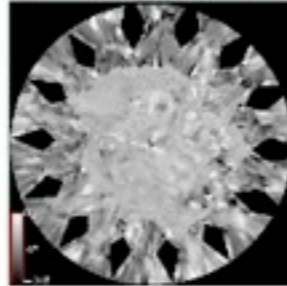



Figure 1: ASCAT SIR images from March 21, 2009 over Antarctica.

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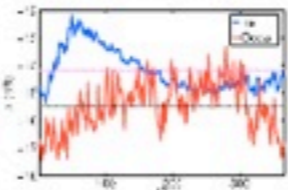
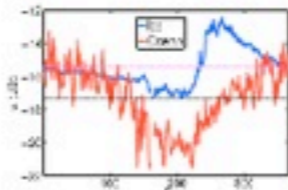



Figure 2: Mean value of the A images for each day in 2009 for ice and ocean. Note the seasonal dependence of the mean values. In Antarctica, the A mean values are typically higher in the Austral summer than in the winter, and the Northern hemisphere shows a similar seasonal dependence.

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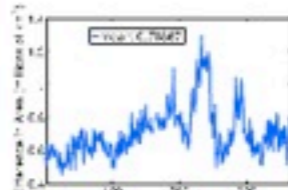
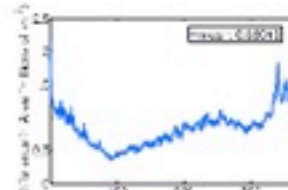



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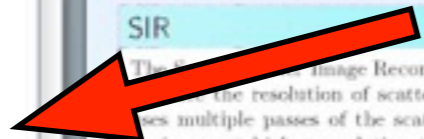
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Chat box



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- 550 km swath on both sides
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SIR

The Synthetic Image Reconstruction (SIR) algorithm is used to increase the resolution of scatterometer images [2]. The algorithm uses multiple passes of the scatterometer over an area to generate an image at higher resolution than the native resolution of the instrument. The SIR algorithm assumes a linear relationship between the incidence angle and σ^0 : $\sigma^0(\theta_i) = A + B(\theta_i - \theta_{ref})$, where θ_i is the incidence angle, $\sigma^0(\theta_i)$ is the measured backscatter at a given incidence angle, A represents the average backscatter normalized to a reference angle, B represents the incidence angle dependence of the backscatter, and θ_{ref} is a reference angle usually 40° . Examples of A and B SIR images over Antarctica on March 21, 2009 for ASCAT are shown in Figure 1. The variance of the reconstruction error for each pixel is used to produce "V" images. These images represent changes in the observed σ^0 due to variations in time, azimuth angle, and incidence angle.

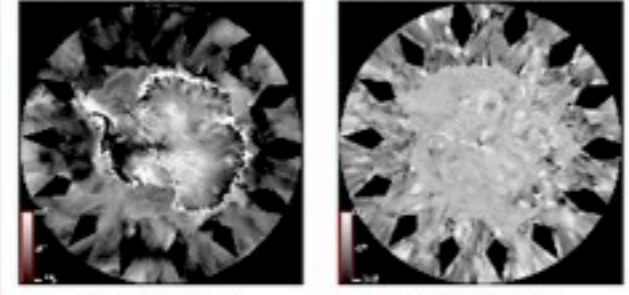
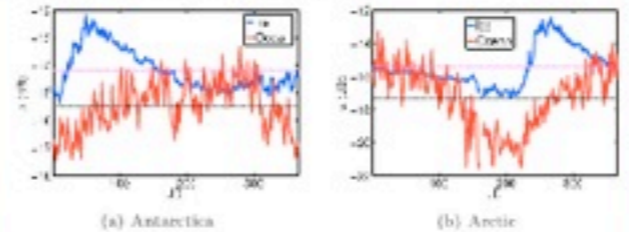


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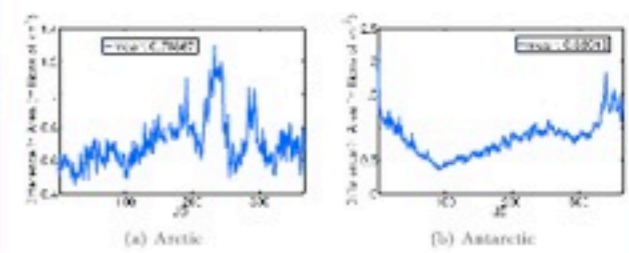


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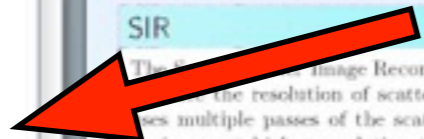
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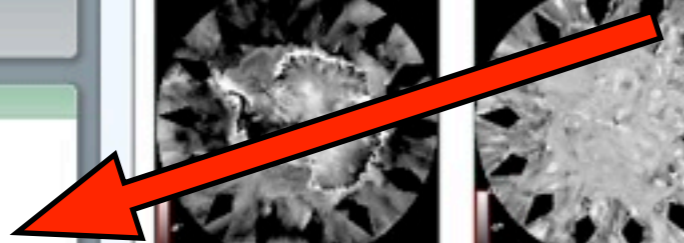
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Space for notes



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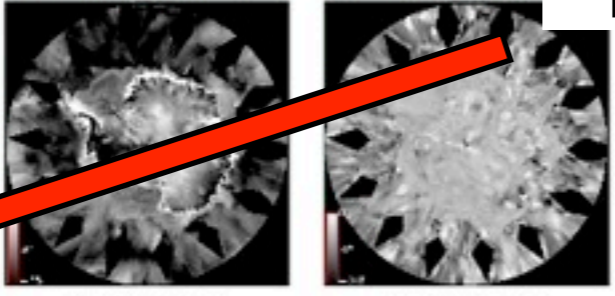
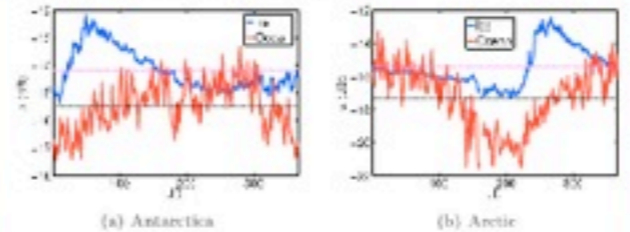


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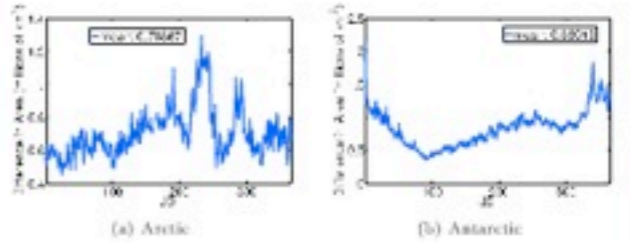


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